

CLAIMS

What is claimed is:

1. An apparatus detecting an amount of ink discharged by a printer, the printer having a plurality of heaters and corresponding nozzles and performing printing by applying pulses to the heaters to heat the heaters and discharge ink through the corresponding nozzles, the apparatus comprising:
 - a detector connected to the heaters that detects a state change of the heaters and outputs a state change signal; and
 - an ink discharge amount calculator that calculates an amount of discharged ink corresponding to the state change output signal from the detector.
2. The apparatus of claim 1, wherein the detector is a current detecting sensor that detects a current flowing through the heaters.
3. The apparatus of claim 2, further comprising a plurality of switches each having a source, a drain, and a base, each source being connected to a respective one of the heaters, and wherein the current detecting sensor is connected to the sources or to the drains to detect current flowing through the heaters when pulses are applied to the bases of the switches.
4. The apparatus of claim 1, wherein the detector is a resistance connected in series between a predetermined power source supplying power to the heaters and the heaters.
5. The apparatus of claim 1, wherein the ink discharge amount calculator comprises:
 - a converter that converts the state change signal output from the detector into an amount of discharged ink; and
 - an integrator that accumulates the amount of discharged ink and previous amounts of discharged ink.
6. The apparatus of claim 5, wherein the ink discharge amount calculator further comprises a comparator that compares a total amount of discharged ink obtained from the integrator with a predetermined threshold amount of ink.

7. An apparatus detecting an amount of ink discharged by a printer, the printer having a plurality of heaters and corresponding nozzles and performing printing by applying pulses to the heaters to heat the heaters and discharge ink through the corresponding nozzles, the apparatus comprising:

- a detector connected to the heaters that detects a state change of the heaters and outputs a state change signal; and

- an ink discharge amount calculator that calculates an actual amount of discharged ink using the state change signal output from the detector; and

- a controller that controls a maintenance operation when the actual amount of discharged ink calculated by the ink discharge amount calculator exceeds a predetermined threshold amount of ink to reduce the amount of ink discharged during maintenance.

8. The apparatus of claim 7, wherein the detector is a current detecting sensor that detects a current flowing through the heaters.

9. The apparatus of claim 7, wherein the detector is a resistance connected in series between a predetermined power source supplying power to the heaters and the heaters.

10. The apparatus of claim 7, wherein the ink discharge amount calculator comprises:

- a converter that converts the state change signal output from the detector into an amount of discharged ink; and

- an integrator that accumulates the amount of discharged ink and previous amounts of discharged ink.

11. The apparatus of claim 10, wherein the ink discharge amount calculator further comprises a comparator that compares a total amount of discharged ink obtained from the integrator with a predetermined threshold amount of ink.

12. The apparatus of claim 11, wherein when the total amount of discharged ink exceeds the predetermined threshold amount of ink, the controller controls the maintenance of the printer to reduce the amount of discharged ink.

13. A method of detecting an amount of discharged ink in a printer using an ink discharge amount detecting apparatus, the printer having a plurality of heaters and corresponding nozzles and performing printing by applying pulses to the heaters to discharge ink through the corresponding nozzles, the method comprising:

- detecting changes in a state of each of the heaters;
- calculating an amount of discharged ink corresponding to the changes in the state of each of the heaters; and
- cumulating each amount of discharged ink.

14. The method of claim 13, wherein said detecting changes in a state of each of the heaters comprises detecting a current flowing through the heaters.

15. A method of detecting an amount of discharged ink in a printer using an ink discharge amount detecting apparatus, the printer having a plurality of heaters and corresponding nozzles and performing printing by applying pulses to the heaters to discharge ink through the corresponding nozzles, the method comprising:

- detecting changes in a state of each of the heaters;
- calculating an amount of discharged ink corresponding to the changes in the state of each of the heaters;
- calculating a cumulative amount of discharged ink;
- comparing the cumulative amount of discharged ink with a predetermined threshold amount; and
- controlling maintenance operations to adjust the amount of discharged ink when the cumulative amount of discharged ink exceeds the predetermined threshold amount.

16. The method of claim 15, wherein said detecting the changes in a state of each of the heaters comprises detecting a current flowing through the heaters.

17. The method of claim 16, wherein said calculating an amount of discharged ink comprises comparing an amount of current flowing through the heaters with a predetermined current value.

18. An apparatus controlling an amount of ink discharged by a printer, comprising:
a power supply;

a nozzle heating unit having a plurality of nozzle heaters;

a current detecting sensor connected between the power supply and the nozzle heating unit, receiving power from the power supply, detecting changes in current flowing through the nozzle heaters, and outputting a current change signal;

an ink discharge amount calculator calculating an amount of discharged ink using the current change signal; and

a controller controlling maintenance operations when the amount of calculated discharged ink exceeds a predetermined threshold amount of ink to reduce the amount of ink discharged during maintenance by providing driving pulses to the nozzle heating unit to drive the nozzle heaters.